UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,390	04/20/2007	Thomas Hamelin	289755US6YA PCT	7051

22850 7590 05/26/2010

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
NUCKOLS, TIFFANY Z	

ART UNIT	PAPER NUMBER
1716	

NOTIFICATION DATE	DELIVERY MODE
05/26/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/587,390	HAMELIN, THOMAS	
	Examiner	Art Unit	
	TIFFANY NUCKOLS	1716	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 February 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-47* is/are pending in the application.

4a) Of the above claim(s) *32-44* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31 and 45-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 July 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. **Claims 1, 4, 5-7, and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 2002/0050246 to Parkhe in view of U.S. Patent No. 5775416 to Heimanson et al.**

4. In regards to Claims 1 and 10-12, Parkhe teach a substrate holder (*104 Fig. 2A*) for supporting a substrate (*102 Fig. 2A*) comprising a supporting surface *(103 Fig. 2A*) with a cooling component (107, *207 Fig. 2A, Para. 0029*); a heating component positioned adjacent to the supporting surface and between the supporting surface and the cooling component (*105 Fig. 2A, Para. 0030*) the cooling component having a plurality of cooling channels (*236 Fig. 2A*) configured to receive a cooling fluid (*Para. 0051*) positioned between the cooling component and the heating component

(*arrangement of 236 between 107 and 105 Fig. 2A*), and a brazing material is disposed between the cooling component and the heating component, the brazing material disposed to form a hermetic seal with the substrate support to maintain the atmospheric environment of the support (*Para. 0042, Para. 0047, Para. 0044, 0050, 0051*).

5. Parkhe does not expressly teach a fluid gap positioned between the cooling component and the heating component such that the fluid gap is interposed between the plurality of the cooling channels of the cooling component and heating component.

6. Heimanson et al teaches a substrate support 20 Fig. 1 that has a supporting surface underneath substrate 18; a cooling component 34 having a plurality of cooling channels 38 configured to receive a cooling fluid; a heating component body 24 with heating component heaters 28 therein positioned adjacent to the supporting surface and between the supporting surface and the cooling component; a fluid gap 50 positioned between the cooling component and the heating component, comprising a groove 50 formed in structure 36, which is part of the cooling component (Col. 3 line 20-Col. 5 line 32, Claims 1-11). Structure 36 is made of stainless steel and is formed such that the top portion of structure 36 could also be considered part of the heating component as it is proximally close to and in contact with it, the bottom portion of 36 forming the top of the cooling component, such that it could either be formed either in the heating component or in the cooling component. The fluid gap 50 is configured to receive a fluid to vary the thermal conductance between the cooling component and the heating component and is connected to the heating component through an outer perimeter ridge, 42 and 46 in the circular substrate support such that the ridge forms a seal (Col. 2

lines 36-47, Col. 5 lines 34-56). The fluid gap inhibits as well as facilitates heat exchanges thus allowing for greater control of the substrate temperature (Col. 2 lines 21-35).

7. It would have been obvious to one of ordinary skill of the art at the time of the invention to add a fluid gap between the heating and cooling components of Parkhe and formed out of one of the heating or cooling components as taught by Heimanson et al. One would be motivated to do so to control the substrate temperature better.

8. Furthermore, Heimanson et al teaches using an O-ring in between the structures 42 and 46 Fig. 1. Parkhe teaches that brazing forms a hermetic seal with the substrate support to maintain the atmospheric environment of the support (Parkhe, *Para. 0042, Para. 0047, Para. 0044, 0050, 0051*). It would have been obvious to one of ordinary skill of the art at the time of the invention to modify the invention of Parkhe in view of Heimanson et al by using a brazing material to seal the fluid gap instead of an o-ring as taught by Parkhe. One would be motivated to do so in order to maintain the atmospheric environment of the support.

9. The resulting apparatus, which brazes the cooling and heating components together and thus would also implicitly braze the fluid gap therein at the ridges 42, 46 to form a hermetic seal as per the teachings of Parkhe, would fulfill the limitations of Claims 1 and 10-12.

10. In regards to Claim 4, Parkhe teaches the cooling component comprises a top plate (*238 Fig. 2B*), i.e., an upper cap and a bottom plate (*107 Fig. 2B*) to form the total cooling component (*207 Fig. 2B*).

11. In regards to Claims 5-7, Parkhe teaches the lower cap has coil-shaped cooling channels configured to receive a cooling fluid therein, upper cap comprising a plate having a flat surface (*see 238 on 107 Fig. 2B*) that is positioned adjacent to the upper cap and the upper cap and the lower cap are brazed together, such that there is implicitly a brazing material there between (*Para. 0043-0045*).

12. Parkhe in view of Heimanson et al do not expressly teach the upper cap comprises a plurality of channels configured to receive a cooling fluid.

13. However, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to rearrange the upper and lower caps, such that the upper cap is now on top of the lower cap, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950). *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975). MPEP 2144.04-VI (c).

14. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to reverse the upper and lower caps, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. *In re Gazda, 219 F.2d 449, 104 USPQ 400 (CCPA 1955).* MPEP 2144.04 VI-A. The simple reversal of the upper and lower caps, such that the upper cap is not the lower cap and the lower cap is now the upper cap, would fulfill all of the limitations of claims 5-7 without changing the operation of the structures.

15. **Claims 13-20 and 26-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 2002/0050246 to Parkhe in view of**

U.S. Patent No. 5775416 to Heimanson et al, as applied to Claim 1 above, and in further view of U.S. Patent No. 3909917 to Lebedev et al.

16. The teachings of Parkhe in view of Heimanson et al are relied upon as set forth in the above 103 rejection of Claim 1.

17. At the outset, it is noted in regards to Claim 26 that the recitation of "means for" limitations are considered to invoke the provisions of 35 U.S.C. 112, sixth paragraph. This recitation has been interpreted in accordance with the Specification and the dependent claims to refer to the following:

Claim 26:

a. Means for preventing the flow of the brazing material into the contact zone: comprises a groove (Claim 27).

18. In regards to Claims 13-17, 19, and 26-31, Parkhe in view of Heimanson et al teach that the cooling component (*Parkhe, 107 Fig. 2B*) and the heating component (*Parkhe, 105 Fig. 2B*) are brazed together *(Parkhe, Para. 0042*), and the fluid gap implicitly therein, as per the rejection of Claim 1 above, such that the top surfaces that define the fluid gaps are implicitly brazed to the heating component, thus making inherent brazing zones.

19. Parkhe in view of Heimanson et al do not expressly teach at least one isolating groove configured to prevent flow of the brazing material in the gap.

20. Lebedev et al teach that it is well known In the art in the method of brazing to place grooves in the *members* to be connected to prevent the running of the brazing filler from the zone of brazing where the brazing material is then collected (*Lebedev,*

Col. 1, lines 49-55). The grooves, by this teaching, are located in both members and near if not in, the zones of brazing, implicitly, as the function of the preventing the running of the brazing filler from the brazing zones would not be accomplished otherwise. This prevents the brazing material from having a chemical reaction with the materials being connected and prevents the deterioration of the brazed joint at high temperatures (*Lebedev, Col. 1, lines 38-48*).

21. It would have been obvious to one of ordinary skill of the art at the time of the invention to modify the substrate holder of Parkhe in view of Heimanson et al by adding grooves into the cooling and heating components and thus implicitly also the fluid gap of Parkhe in view of Heimanson et al, thus forming a plurality of grooves, near or in the brazing zones, as taught by Lebedev et al. One would be motivated to do so to prevent the brazing material from having a chemical reaction with the materials being connected and prevent the deterioration of the brazed joint at high temperatures. The grooves trap the brazing material in the zone of brazing, such that the flow of the brazing material is contained in the brazing zones are thus are configured to prevent the flow of the brazing material into the fluid gaps. The resulting apparatus, with isolating grooves in the heating and cooling components, fulfills the limitations of claims 13-17, 19, and 26-31.

22. In regards to Claims 18 and 20, Parkhe in view of Heimanson et al and in further view of Lebedev do teach that the brazing zones, which are in the same shape as substrate support, is circular as evidenced in Parkhe Fig. 2A and Heimanson et al Fig. 4, and must implicitly be formed at the ridges 42, 46 of Heimanson et al, as per the 103 rejection above, such that the isolating grooves are implicitly concentric circles.

23. Furthermore, a change of shape is generally recognized as being within the skill of one of ordinary skill in the art. It is noted that Applicant has not made any showing of criticality shape of the isolating grooves (or the fluid gap grooves) that would tend to point toward the non-obviousness of freely selecting a concentric shape as a matter of choice. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). See MPEP 2144.04 IV B.

24. **Claims 2, 3, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 2002/0050246 to Parkhe in view of U.S. Patent No. 5775416 to Heimanson et al, as applied to Claim 1 above, and in further view of U.S. Patent No. 5280156 to Niori et al.**

25. The teachings of Parkhe in view of Heimanson et al are relied upon as set forth in the above 102 rejection of Claim 1.

26. In regards to Claims 2, 3, 8, and 9, Parkhe in view of Heimanson et al does not expressly teach the heating component is comprised of a body portion and an embedded heater disposed in the body portion.

27. Niori et al teach a wafer heating apparatus with a heating element (*Niori, 3 Fig. 1, 3*), i.e., heater, embedded in a ceramic substrate (*Niori, 2 Fig. 1, 2a/b Fig. 3*), i.e., a body portion (*Niori, Claim 1, Col. 4 lines 11-27*). Niori et al teach the body portion is made of aluminum nitride (*Niori, Col. 5 lines 45-64*) such that the embedded heater is implicitly case in the body of aluminum nitride, an aluminum alloy. Niori et al further teach that the heater has a supporting surface *(Niori, 4A Fig. 3*) for a substrate (*Niori, W*

Fig. 3) that is mechanically connected to the heater via an adhesive material (*Niori, 5A Fig. 3, and Col. 6 line 50-Col. 7 line 31*).

28. It would have been obvious to one of ordinary skill in the art at the time of the invention, with a reasonable expectation of success, to alternatively substitute the heating component in Parkhe in view of Heimanson et al with the heating component as taught by Niori et al, as art-recognized equivalent means for providing heat to a substrate. It has been held that an express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). See MPEP 2144.06 II. The resulting apparatus fulfills the limitations of claims 2, 3, 8, and 9.

29. **Claims 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 2002/0050246 to Parkhe in view of U.S. Patent No. 5775416 to Heimanson et al and U.S. Patent No. 3909917 to Lebedev et al, as applied to Claim 19 above, and in further view of U.S. Patent No. 5280156 to Niori et al.**

30. The teachings of Parkhe in view of Heimanson et al and Lebedev are relied upon as set forth in the above 103 rejection of Claim 19.

31. In regards to Claims 21-25, Parkhe teaches the cooling component (*Parkhe, 107 and 238*) are made of the same material (*Parkhe, Para. 0046*). Parkhe further teaches of a separate embodiment the upper cap (*Parkhe, 107*) is made of aluminum nitride (*Parkhe, Para. 0049*).

32. It has been held that the selection of a known material based on its suitability for its intended use supports a prima facie obviousness determination. See MPEP 2144.07. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). Thus it would be prima facie obvious to one of ordinary skill in the art at the time of the invention to make the upper cap out of aluminum nitride, an aluminum alloy.

33. Parkhe in view of Heimanson et al and Lebedev do not expressly teach the heating component is made of an aluminum alloy.

34. Niori et al teach a wafer heating apparatus with a heating element (*Niori, 3 Fig. 1, 3*), i.e., heater, embedded in a ceramic substrate (*Niori, 2 Fig. 1, 2a/b Fig. 3*), i.e., a body portion (*Niori, Claim 1, Col. 4 lines 11-27*). Niori et al teach the body portion is made of aluminum nitride (*Niori, Col. 5 lines 45-64*) such that the embedded heater is implicitly case in the body of aluminum nitride, an aluminum alloy. Niori et al further teach that the heater has a supporting surface *(Niori, 4A Fig. 3*) for a substrate (*Niori, W Fig. 3*) that is mechanically connected to the heater via an adhesive material (*Niori, 5A Fig. 3, and Col. 6 line 50-Col. 7 line 31*).

35. It would have been obvious to one of ordinary skill in the art at the time of the invention, with a reasonable expectation of success, to alternatively substitute the heating component in Parkhe in view of Heimanson et al and Lebedev with the heating component as taught by Niori et al, as art-recognized equivalent means for providing heat to a substrate. It has been held that an express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). See

MPEP 2144.06 II. The resulting apparatus fulfills the limitations of claims 21-25, as the heating component and the cooling components are made of the same aluminum alloy, with a heater embedded in the body of the heating component.

36. **Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 2002/0050246 to Parkhe in view of U.S. Patent No. 5775416 to Heimanson et al, as applied to Claim 1 above, and in further view of U.S. Patent No. 5078851 to Nishihata et al.**

37. The teachings of Parkhe in view of Heimanson et al are relied upon as set forth in the above 102 rejection of Claim 10.

38. In regards to Claim 12, Parkhe in view of Heimanson et al do not expressly teach the fluid gap groove is disposed in the heating component.

39. Nishihata et al teach a substrate holder (*Nishihata, Fig. 4*) with a heating component (*Nishihata, 20 Fig. 4*) with a fluid gap groove (*Nishihata, 34 Fig. 4*) in the heating component (*Nishihata, Col. 7 lines 55 - Col. 8 line 11*).

40. Because it is known in the art to include either a fluid gap groove with the heating component, and the results of the combination would be predictable, namely, an effective way to control the temperature of the substrate, it would have been obvious to one of ordinary skill in the art at the time of the invention to have a fluid gap groove with the heating component. The resulting apparatus would yield the claimed invention. See MPEP 2143 Rationale A.

41. **Claims 45-47 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application No. 2002/0050246 to Parkhe in view of U.S. Patent No. 6051074 to Strodtbeck et al and U.S. Patent No. 6736206 to Hisai.**

42. At the outset, it is noted in regards to Claim 45 that the recitation of "means for" limitations are considered to invoke the provisions of 35 U.S.C. 112, sixth paragraph. This recitation has been interpreted in accordance with the Specification and the dependent claims to refer to the following:

Claim 45

b. Means for cooling the supporting surface: a thermoelectric device (Claim 46, Para. 0038 of Specification).

c. Means for heating the supporting surface: a thermoelectric device and a channel configured to flow at least one of elevated temperature fluorinated dielectric liquid, water, and steam (Claim 46, Para. 0038 of Specification).

d. Means for receiving a fluid: channel (Claim 47, Para. 0038 of Specification).

e. Means for connecting the means for cooling and the means for heating: brazing, Paragraph 0036.

43. In regards to Claims 45-47, Parkhe in view of Heimanson et al teach a substrate holder (*Parkhe, 104 Fig. 2A*) for supporting a substrate (*Parkhe,102 Fig. 2A*) comprising a supporting surface *(Parkhe,103 Fig. 2A*) with a cooling component (*Parkhe,107, 207 Fig. 2A, Para. 0029*) that implicitly cools the supporting surface by being part of the substrate holder; a heating component positioned adjacent to the supporting surface

and between the supporting surface and the cooling component (*Parkhe, 105 Fig. 2A, Para. 0030*); a fluid gap (*Parkhe, 236 Fig. 2A*) positioned between the cooling component and the heating component (*Parkhe, arrangement of 236 between 107 and 105 Fig. 2A*), the fluid gap configured to receive a fluid to vary the thermal conductance between the cooling component and the heating component implicitly through cooling (*Parkhe, Para. 0044, 0050, 0051*); and a brazing material is disposed between the cooling component and the heating component, the brazing material disposed adjacent to the fluid gap implicitly to form a hermetic seal with the substrate support (*Parkhe, Para. 0042, Para. 0047*).

44. Parkhe does not teach the means for cooling the supporting surface is a thermoelectric device.

45. Strodtbeck et al teach a substrate support (*Strodtbeck, 12*) where the cooling apparatus therein is a thermoelectric cooling unit (*Strodtbeck, Col. 5 line 15-Col. 6 line 11, Claim 1*).

46. It would have been obvious to one of ordinary skill in the art at the time of the invention, with a reasonable expectation of success, to alternatively substitute the cooling component in Parkhe with the thermoelectric cooling means as taught by Strodtbeck et al, as art-recognized equivalent means for providing cooling to the substrate support. It has been held that an express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). See MPEP 2144.06 II.

47. Parkhe in view of Strodtbeck et al do not teach the means for heating comprises at least one of a thermoelectric device and a means for receiving fluid comprises a channel to flow at least one of the elevated temperature fluorinated dielectric liquid, water, and steam.

48. Hisai teaches a substrate support (*Hisai, 11 Fig. 1*) with a substrate placed thereon (*Hisai, W Fig. 1*) that is comprised of a heater (*Hisai, 17 Fig. 1*) that heats the working fluid (*Hisai, 16 Fig. 1*) through an internal space with a plurality of rims that implicitly form channels which move, or flow the liquid therein, thus being a means of heating as a thermoelectric device with a means of receiving a fluid in the means for heating to flow an elevated temperature liquid (*Hisai, Para. 0028-0032*).

49. It would have been obvious to one of ordinary skill in the art at the time of the invention, with a reasonable expectation of success, to alternatively substitute the heating component in Parkhe with the thermoelectric heating means and fluid receiving means as taught by Hisai, as art-recognized equivalent means for providing cooling to the substrate support. It has been held that an express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). See MPEP 2144.06 II. The resulting apparatus would fulfill the limitations of claims 45-47, as the substitution of the elements into Parkhe would have the same arrangement and means for connecting.

Response to Arguments

50. Applicant's arguments filed 02/16/2010 have been fully considered but they are not persuasive. Specifically, the argument of the means-plus-function has not positively required the newly recited limitation of a fluid gap position in between the cooling and heating components. The previous rejections for Claims 45-47 are thus maintained.

51. Applicant's arguments with respect to claims 1-31 and 45-47 have been considered but are moot in view of the new ground(s) of rejection, which are necessitated by the amendments to the claims. Specifically, new fluid gap limitation being between the heating and cooling components has been remedied by the teachings of Heimanson et al. The previous rejection for Claims 45-47 have been maintained.

Conclusion

52. Applicant's amendment necessitated any new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

53. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

54. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIFFANY NUCKOLS whose telephone number is (571)270-7377. The examiner can normally be reached on Monday through Friday 9:00AM - 5:30 PM.

55. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

56. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TIFFANY NUCKOLS/
Examiner, Art Unit 1716

/Parviz Hassanzadeh/
Supervisory Patent Examiner, Art Unit 1716